

Extended Abstract: Factors Influencing the Adoption of National Geospatial Information Management in Small Island Developing States

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The management of geospatial information has progressively evolved over the past few decades, and has become an integral part of sustainable development initiatives worldwide. National Geospatial Information Management (NGIM) systems, including frameworks like the United Nations Integrated Geospatial Information Framework (UN-IGIF), offer a structured approach to integrating geospatial data into national development strategies (UN-GGIM, 2018; Scott & Rajabifard, 2017). The unique socio-economic and environmental challenges faced by Small Island Developing States (SIDS) requires robust geospatial information management systems to enhance climate resilience and sustainable development (UN-OHRLLS, 2015).

The Small Island Developing States (SIDS) represent a distinct group of 39 States and 18 Associate Members of United Nations regional commissions. These states are characterized by unique social, economic, and environmental vulnerabilities exacerbated by their small size, remoteness, and susceptibility to natural disasters (UN-OHRLLS, 2015). Small Island Developing States (SIDS) were first recognized as a distinct group at the United Nations Conference on Environment and Development in June 1992 which was held in Rio de Janeiro, Brazil where it was stated: “Small Island Developing States, and islands supporting small communities are a special case both for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from markets, place them at a disadvantage economically and prevent economies of scale” The aggregate population of all the SIDS is 65 million, slightly less than 1% of the world’s population, yet this group faces unique social, economic, and environmental challenges.

National Geospatial Information Management (NGIM) refers to the comprehensive framework for coordinating, collecting, managing, sharing, and utilizing geospatial data at a national level. This encompasses the policies, technologies, standards, and institutional arrangements necessary to ensure that geospatial information is available and accessible for decision-making processes, supporting sustainable development, economic growth, and environmental management.

Over the years there has been a consistent evolution of the national Geospatial Management often referred to as National Spatial Data Infrastructure (NSDI). Despite a wealth of literature focusing on the engineering aspects of Spatial Data Infrastructure (SDI) development, (Mulder et al., 2020; Gómez et al., 2019; Nedović-Budić et al., 2011; Giff & Crompvoets, 2008), research on the factors influencing the adoption of NGIM in SIDS doesn't exist. We know relatively little about the ideal circumstances to spur national geospatial information management adoption in the context of Small Island Developing States (SIDS). This dissertation aims to bridge the gap in that understanding by identifying the factors influencing the adoption of national geospatial information management in SIDS.

Research Question, Aim, and Objectives

To navigate this multifaceted topic, the research is guided by the following critical research questions:

1. What are the factors influencing the adoption of NGIM in SIDS?
2. Does the absence or presence of a National Innovation System moderate the relationship between TOE factors and the adoption of NGIM in SIDS?

These questions are designed to address the key challenges identified in the literature and further extend the environmental context to capture the pressures due to climate vulnerability. It will also explore the moderating effects of contextual factors National Innovation Systems on the adoption of NGIM.

Theoretical Framework

The Technology-Organization-Environment (TOE) framework, introduced by Tornatzky and Fleischer (1990), provides a comprehensive model for understanding the adoption of technological innovations within organizations. This framework will provide the theoretic foundation for the study. This framework categorizes the influential factors into three contexts: technology, organization, and environment. Each of these contexts plays a pivotal role in the decision-making process for adopting new technologies such as NGIM systems (Oliveira & Martins, 2011; Baker, 2012).

To explore the factors influencing the adoption of National Geospatial Information Management (NGIM) systems within Small Island Developing States (SIDS) the following hypotheses will be tested:

- **H1:** Perceived Relative Advantage positively influences the intention to adopt NGIM
- **H2:** Perceived Complexity negatively influences the intention to adopt NGIM
- **H3:** Organizational Readiness positively influences the intention to adopt NGIM
- **H4:** Top Management Support positively influences the intention to adopt NGIM
- **H5:** External Pressure positively influences the intention to adopt NGIM
- **H6:** Regulatory Support positively influences the intention to adopt NGIM

Moderating Hypotheses (Role of National Innovation System)

- **H7:** The presence of a NIS positively moderates the relationship between Perceived Relative Advantage and the intention to adopt NGIM
- **H7a:** The presence of a NIS positively moderates the relationship between Perceived Complexity and the intention to adopt NGIM
- **H7b:** The presence of a NIS positively moderates the relationship between Organizational Readiness and the intention to adopt NGIM
- **H7c:** The presence of a NIS positively moderates the relationship between Top Management Support and the intention to adopt NGIM

Methods

This study will use a quantitative approach to comprehensively understand the factors influencing the adoption of National Geospatial Information Management (NGIM) in Small Island Developing States (SIDS) and will employ Partial Least Squares Structural Equation Modeling (PLS-SEM). An electronic survey will be conducted to gather empirical data on perceptions about the role of TOE factors in NGIM adoption. Qualitative comments from the survey respondents will be used to provide supplementary insights and context.

Intended Contribution to Theory and Practice

This research aims to contribute both to theory and practice by providing a detailed examination of the factors influencing the adoption of NGIM in SIDS. The study will extend the TOE framework by incorporating climate vulnerability as an environmental factor and national innovation systems (NIS) as a moderating variable, thus offering a nuanced understanding of the unique challenges faced by SIDS. Practically, the research will offer actionable insights for policymakers and practitioners in SIDS, aiding in the development and implementation of effective geospatial information management strategies that are tailored to local contexts and conditions.